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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

MCGUTHRY BANKS, TIMA MICHELE

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

10/06/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/574,839	Applicant(s) HARA ET AL.	
	Examiner TIMA M. MCGUTHRY-BANKS	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/28/08, 3/03/08, 4/06/06</u> . | 6) <input type="checkbox"/> Other: ____. |

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DETAILED ACTION

Status of Claims

Claims 1-3 and 12 are as originally filed and Claims 4-11 are currently amended.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by JP 05-186813 (English abstract and machine translation).

JP '813 anticipates the claimed invention. JP '813 teaches high purity and high cleanliness steel production. Metallic or alloyed Mg is added into molten steel, and a reduced pressure (vacuum) treatment is executed. The added Mg reacts with O₂ in the molten steel to make MgO (abstract). The concentration of the Mg in the molten steel is fixed at 0.5 ppm (page 3).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

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evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '813 as applied to claim 1 above, and further in view of Coad et al (US 3,764,297).

JP '813 discloses the invention substantially as claimed. However, JP'813 does not specifically teach a primary melting process and remelting process as in Claims 2 and 3 or the pressures as claimed in Claim 5. Coad et al teaches a method and apparatus for purifying metal under vacuum. The metal is melted in a first vacuum region and is passed to a second vacuum region having a substantially lower pressure than the first vacuum region (column 1, lines 11-35). Regarding Claims 2 and 3, it would have been obvious to one of ordinary skill in the art at the time the invention was made to process the steel in JP '813 with VIM/VAR as taught by Coad et al, since vacuum processing of steel, such as vacuum induction melting (VIM) and vacuum arc remelting (VAR), results in a cleaner alloy. This may effect a substantial improvement in the workability of steel and in its fatigue properties. Regarding Claim 5, Coad teaches a first pressure of 10-100 microns (1.3-130 kPa) and a second pressure of less than 1 micron (0.13 kPa). Further regarding Claim 4, JP '813 teaches nitrogen on page 3.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '813 as applied to claim 1 above, and further in view of Zeze et al (US 6,585,799).

JP '813 discloses the invention substantially as claimed. However, JP '813 does not disclose a ratio of aluminum to magnesium as in Claim 6 or a Ni-Mg alloy as in Claim 7. Zeze

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et al teaches a cast steel. Mg and Al have a great influence on the effect on equiaxed crystallization (column 7, lines 50-54). Al can be added as a Ni-Mg alloy (column 13, line 43). One example of the ratio of Al and Mg is 70/15 or 4.67 (column 32, line 64 and column 33, line 7). Regarding Claim 6, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add Al and Mg in the claimed ratio as taught by Zeze et al, since Zeze et al teaches that it is possible to eliminate cracks and dents generated on the surface of a cast steel, suppress center segregation and center porosity, etc, generated in the interior, suppress reconditioning and scrapping of the cast steel and a steel material processed therefrom, and to improve quality (column 33, lines 25-30). Regarding the composition of the Ni-Mg alloy, the amount of Mg has to be less than 50 in the case where the claimed ranges overlap or lie inside ranges disclosed by the prior art, a *prima facie* case of obviousness exists. See MPEP § 2144.05.

Claims 8, 9 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '813 as applied to claim 1 above, and further in view of Smith, Jr. et al (US 4,871,511).

JP '813 discloses the invention substantially as claimed. However, JP '813 does not disclose the composition of the cast steel as in Claims 8, 9 and 12, that the steel is a maraging steel as in Claims 10 and 12. Smith, Jr. et al teaches maraging steels. With regard to general processing of the alloy, melting can be carried out by argon-oxygen decarburization followed by VIM followed by VAR. The composition is low levels of oxygen (nitrogen is not taught), up to 0.05% carbon, at least 1 to 1.25% Ti, 17 to 19% Ni, Co is present, 2-4% Mo, and Al in a small amount (column 1, line 63 to column 2, line 13), such as up to 1% (Claim 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made that the steel in JP '813 could have the composition as in the steel taught by Smith, Jr. et al, since Smith, Jr. et al

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teaches that the steel can be processed by vacuum melting, and this composition yields in a steel with desirable properties of toughness, Charpy V-Notch impact energies, yield strength and toughness (column 3, lines 55-64). In the case where the claimed ranges overlap or lie inside ranges disclosed by the prior art, a *prima facie* case of obviousness exists. See MPEP § 2144.05.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '813 as applied to claim 1 above, and further in view of Kelly et al (US 5,133,812)

JP '813 discloses the invention substantially as claimed. However, JP '813 does not disclose that the produced steel is a tool steel as in Claim 11. Kelly et al teaches a corrosion resistant, high strength cutting tool. The tool body is made by VIM/VAR (column 3, line 31). It would have been obvious to one of ordinary skill in the art at the time the invention was made to expect that the steel made by JP '813 could be a tool steel, since Kelly et al teaches that tool steels are made by vacuum melting.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TIMA M. MCGUTHRY-BANKS whose telephone number is (571)272-2744. The examiner can normally be reached on M-F 7:00 am - 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art Unit
1793

/T. M. M./
Examiner, Art Unit 1793
4 October 2008